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DATE: April 14, 2006

TO: Examiner Eric Fuller  
Group Art Unit 1762

FAX #: 571-273-8300

PHONE #:

Application No.: 09/715,935  
Applicant: BI  
Due Date: April 17, 2006

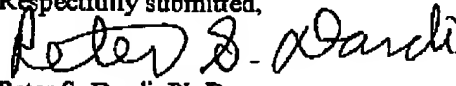
OUR REF.: 2950.16US02

FROM: Peter S. Dardi  
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Attached please find the following document(s) for filing in the above-identified patent application:

1. Request for Rehearing under 37 C.F.R. 41.52 (18 pgs)

Respectfully submitted,

  
Peter S. Dardi, Ph.D.  
Reg. 39.650

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PATENT APPLICATION

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the application of:

Attorney Docket No.: 2950.16US02

Bi et al.

Appeal No.: 2006-0289

Application No.: 09/715,935

Examiner: Eric Fuller

Filed: November 17, 2000

Group Art Unit: 1762

For: COATING FORMATION BY REACTIVE DEPOSITION

**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES****REQUEST FOR REHEARING****UNDER 37 C.F.R. 41.52**

Mail Stop Appeal Briefs - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**INTRODUCTORY COMMENTS**

In response to the Board of Appeals Decision of February 17, 2006, Appellants respectfully request consideration of this timely filed Request for Rehearing. Due to the complexity of the issues, Appellants respectfully request an opportunity to present oral arguments. Specific errors of law and fact are respectfully noted in the following.

*Please grant any extension of time necessary for entry; charge any fee due to Deposit Account No. 16-0631.*

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Date

April 14, 2006

Peter S. Dardi

Peter S. Dardi

Appeal No. 2006-0289

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

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Ex parte Xiangxin Bi, Ronald J. Mosso, Shivkumar Chiruvolu, Sujeet Kumar, James T. Gardner,  
Seung M. Lim, and William E. McGovern

Pending rejections

Following the board decision, the following rejections remain:

- A. The rejection of claims 18-26, 28, 29, 33-41, 44, 46-51, 56-57 and 59-61 as obvious under 35 U.S.C. § 103(a) over U.S. Patent 6,280,802 to Akedo et al. (Akedo) in view of U.S. Patent 5,958,348 to Bi et al. (Bi) and U.S. Patent 5,874,134 to Rao et al. (Rao).
- B. The rejection of claims 30, 43, 45, 52 and 58 as obvious under 35 U.S.C. § 103(a) over U.S. Patent 6,097,144 to Lehman in view of U.S. Patent 6,280,802 to Akedo et al. (Akedo) and U.S. Patent 5,958,348 to Bi et al. (Bi) and U.S. Patent 5,874,134 to Rao et al. (Rao) and in further view of WO 99/23189 to Kambe et al. (Kambe).
- C. The rejection of claims 18-26, 28, 29, 33-41, 43-52 and 56-61 as obvious under § 103(a) over U.S. Patent 6,280,802 to Akedo et al. (Akedo) in view of WO 99/23189 to Kambe et al. (Kambe) and U.S. Patent 5,874,134 to Rao et al. (Rao).
- D. The rejection of claim 30 as obvious under § 103(a) over U.S. Patent 6,097,144 to Lehman et al. (Lehman) in view of U.S. Patent 6,280,802 to Akedo et al. (Akedo), WO 99/23189 to Kambe et al. (Kambe) and U.S. Patent 5,874,134 to Rao et al. (Rao).
- E. The rejection of claims 31 and 32 as obvious under § 103(a) over U.S. Patent 6,074,888 to Tran et al. (Tran), in view of U.S. Patent 6,097,144 to Lehman et al. (Lehman) and further in view

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of U.S. Patent 6,280,802 to Akedo et al. (Akedo), U.S. Patent 5,958,348 to Bi et al. (Bi) and U.S. Patent 5,874,134 to Rao et al. (Rao) and in view of WO 99/23189 to Kambe et al. (Kambe).

F. The rejection of claims 31 and 32 as obvious under § 103(a) over U.S. Patent 6,074,888 to Tran et al. (Tran), in view of U.S. Patent 6,097,144 to Lehman et al. (Lehman) and further in view of U.S. Patent 6,280,802 to Akedo et al. (Akedo), WO 99/23189 to Kambe et al. (Kambe) and U.S. Patent 5,874,134 to Rao et al. (Rao).

G. The rejection of claims 18-26, 28, 29, 33-42, 47-51, 53, 54, 56 and 57 as obvious under § 103(a) over U.S. Patent 6,032,871 to Börner et al. (Börner) in view of U.S. Patent 5,958,348 to Bi et al. (Bi) and U.S. Patent 5,874,134 to Rao et al. (Rao).

H. The rejection of claims 42-54 as obvious under § 103(a) over U.S. Patent 6,032,871 to Börner et al. (Börner) in view of U.S. Patent 6,280,802 to Akedo et al. (Akedo), U.S. Patent 5,958,348 to Bi et al. (Bi) and U.S. Patent 5,874,134 to Rao et al. (Rao).

#### Status of Claims and Claim Groupings

The Board reversed all rejections of claim 27. This claim was the sole claim in claim group 3 of the appeal. Claim groups 1, 2 and 4-6 remain. On further reflection, Appellants withdraw their request for separate consideration of claim groups 4 and 5. Thus, claim groups 4 and 5 can be considered along with claim group 1.

1. Claims 18-21, 23, 25, 28-30, 43 and 44 form a first claim group directed to a method of coating a substrate.
2. Claims 22, 24, 26, 33, 35-38, 45-49 and 57 form a second claim group directed to a method for coating a substrate comprising reacting an elongated reactant stream.
4. Claims 31 and 32 form a fourth claim group directed to a method for forming an optical component on a substrate surface.

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5. Claims 34, 39-41, 50-52, 55, 56 and 58-61 form a fifth claim group directed to a method for coating a substrate at deposition rates within particular ranges.
6. Claims 42, 53 and 54 form a sixth claim group directed to a method for coating a substrate with multiple product streams.

### ISSUES FOR RECONSIDERATION

Appellants respectfully assert that the Board made the following clear errors of law and fact.

With respect to appropriate issues, Appellants agree with the Board's assertion in footnote 4 of the Board decision that Rao is cumulative to the combined teachings of Akedo and Bi and implicitly is cumulative to the combined teachings of Akedo and Kambe. Thus, consistent with the Board's decision, Rao is not referenced in circumstances in which it is cumulative.

A) Rejection Over Akedo in view of Bi and Rao

Group 1, 4 and 5 Claims

Claim Scope - Error of Law

The Board decision refers to claim scope on page 9 and in the bridging paragraph between pages 11 and 12. With all due respect, the Board's assertion on claim scope is not completely clear. Applicants acknowledge that the USPTO should give claims their broadest reasonable interpretation. However, claims must be interpreted in view of the specification. *Philips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005)(en banc). Thus, the claim construction must be reasonable in view of the specification. Furthermore, claims are interpreted from the perspective of a person of ordinary skill in the art. "The broadest reasonable interpretation of the claims must be consistent with the interpretation that those skilled in the art would reach." MPEP 2111, citing *In re Cortright*, 165 F.3d 1353, 1359 (Fed. Cir. 1999).

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The Board noted on page 9 that the specification indicates "that the particles may be produced in a chamber separate from the coating chamber." Applicants do not dispute this statement generally since it would cover embodiments in Applicant's Fig. 3. However, the claim language clearly requires that the coating being formed from particles in a flow without collecting the particles. The specification furthermore makes it clear that this interpretation precluding particle collection prior to coating would be the only reasonable interpretation of the claim to a person of ordinary skill in the art. Claims directed to particle production in a coating chamber are being separately prosecuted in a CIP application, and these claims would seem to be clearly free of these references based on the Board's analysis.

In a proper construction of the present claims, the particles cannot be produced, collected and transported to a coating apparatus. The Board's decision is not clear on this point with respect to the scope they are attributing to the claim. The description of "the product stream" in claim 18 precludes any reasonable interpretation that involves collection of the particles, and a review of the specification throughout amplifies this interpretation. The Board noted on page 12 that the claimed "process encompasses unrecited steps as well as the use of additional equipment to facilitate the combination of Bi and Akedo." However, any additional steps and equipment cannot be contrary to the explicit language of the claim.

"The broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach." MPEP 2111 citing *In re Cortright*, 165 F.3d 1353, 1359 (Fed. Cir. 1999). "To be sure, *Moleculon* acknowledges that 'a transition term such as 'comprising' ... does not exclude additional unrecited elements, or steps (in the case of a method claim),' 793 F.2d at 1271, 229 USPQ at 812, but in the very same sentence the court limited this broad view of 'comprising' to avoid altering the scope of the particular claim step at issue. See *Id.* Neither may the term 'comprising' alter the scope of the merger element in the

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claim at issue here. 'Comprising' is not a weasel word with which to abrogate claim limitations." *Spectrum International, Inc. v. Sterlite Corp.*, 164 F.3d 1372, 1378, 1379 (Fed. Cir. 1998).

Claim 18 reads as follows (emphasis added):

18. (Previously Presented) A method of coating a substrate, the method comprising:  
reacting a reactant stream within a flow by directing a radiation beam at the reactant stream to produce **within the flow a product stream** comprising particles downstream from the radiation beam, wherein the particles are produced by the reaction, wherein the flow passes through the radiation beam, and wherein the reaction is driven by energy from the radiation beam;  
**directing the flow of the product stream** to a substrate; and  
moving the substrate relative to **the flow of the product stream** to coat the substrate.

Claim 18 says unambiguously that the reacting of the reactant stream produces a "product stream" "in the flow." Merriam Webster's Tenth Collegiate Dictionary (emphasis added) defines flow as a noun to be "a smooth **uninterrupted** movement or progress." Similarly, stream is defined as "an **unbroken** flow." Claim 18 further recited the step of "directing **the flow of the product stream** to a substrate." **THE** flow and **THE** particle stream clearly refer back to the flow created from reacting the reactant flow in the first step of claim 18. This would also be the natural reading of a person of ordinary skill in the art. If the particles are collected and moved to a separate coating apparatus, the second step of claim 18 is not practiced. An interpretation directly contrary to an explicit claim step is simply and clearly NOT reasonable and contrary to the law.

In addition, throughout Applicants' specification and figures, the point is made over and over again, that the coating is performed from a continuous **flow** initiated with the reactants. See, for example, the first paragraph of the Detailed Description of the Illustrative Embodiments where it is described that light reactive deposition "as described herein, is an adaptation of laser pyrolysis for

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the immediate deposition of particles onto a surface." At page 11, lines 23-26, it is stated that "For embodiments with a separate coating chamber, the coating chamber can be connected to the coating chamber through a conduit. A pump can be connected to the coating chamber to maintain overall flow and an appropriate pressure through the system." There is absolutely nothing in the entire specification that would support in any way an interpretation by the Board that the particles could be collected and transferred to a different apparatus.

Thus, if the Board was interpreting claim 18 as covering collecting particles from a Bi apparatus and moving the collected particles to an Akedo apparatus this is directly contrary to the second step of claim 18 which requires that the coating be done in the same flow so that the particles never stop moving from their formation until the coating is formed. In addition, not only is such a claim construction directly contrary to the explicit language of the claim, such an interpretation cannot hold up in any way whatsoever in view of the specification. With all due respect, if the Board used a claim interpretation in reaching their decision involving collecting the particles prior to forming the coating, it is a clear, unambiguous, irrefutable and reversible error of law.

Since a claim interpretation based on collecting the particles prior to forming a coating clearly is unsustainable, the discussion of rejections A-F ignores this claim interpretation. This would also be consistent with the claim construction used by the Examiner.

Error of Law - Reference in the Present Specification to the Bi Apparatus

"It is impermissible, however, to simply engage in a hindsight reconstruction of the claimed invention, using applicant's structure as a template and selecting elements from references to fill the gaps." In re Gorman, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). "In order to prevent a hindsight-based obviousness analysis, we have clearly established that the relevant inquiry for determining the scope and content of the prior art is whether there is a reason, suggestion, or motivation in the



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prior art or elsewhere that would have led one of ordinary skill in the art to combine the references." *Ruiz v. A.B. Chance Co.*, 57 USPQ2d 1161, 1167 (Fed. Cir. 2000). "The test is not whether one device can be an appropriate substitute for another." *Id.* "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *W. L. Gore & Assocs., Inc. v. Garlock, Inc.*, 220 USPQ 303, 312-13 (Fed. Cir. 1983).

As footnote 3, the Board cites to Appellants' specification with respect to its description of Bi. However, this is directly contrary to the law. Clearly, there are overlapping inventors with respect to Appellants' application and Bi. Certainly, the present inventors can place their invention in the context of their earlier work. It is very clear error of law to use this against the present Appellants. This statement points to clear hindsight reasoning based on Appellants' specification, in the Board's entire analysis. Based on this clear error of law, the Board's conclusions should be reversed.

Errors of Fact and Law - Motivation is Lacking and Viewing References as a Whole

As noted by the Board and as widely known, cited references must be viewed as a whole. Yet, the Board and previously the Examiner recite for support of motivation the statement in Bi that the Bi apparatus "makes efficient use of resources at high production capacity without sacrificing quality of the particles." The Bi apparatus has a significantly elongated reactant inlet. From the discussion in Bi, it is clear that it is these features of the Bi apparatus that provide for the efficient use of resources at a high production capacity. Yet this context has been ignored by the Board and the Examiner. This sentence quoted from Bi is only directed toward ways of producing and collecting particles and has nothing to do with the subject matter of Akedo or Applicants' claimed invention. Ignoring this context is a clear error of law and error of fact.

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For the present, for arguments sake, let's ignore the context of the quoted sentence. Even under this context, Appellants strenuously maintain that the requisite motivation is not present. Looking at Bi as a whole, we see as representative examples, "Efficient Production of **Particles**" (title), "producing **particles**" (column 1, lines 5-6, Field), "nanoparticles" referenced throughout the background, the use of particle collectors from column 10, line 1 to column 11, line 16, particle size analyzers (column 10, line 4-8), etcetera. Thus, absolutely nothing in Bi points in any way to the present invention where a coating is deposited without collecting the particles.

But Bi also teaches away. For example, referring to column 5, lines 15-27:

"Gas supply system 100 preferably includes a shielding gas supply system. An inert gas, termed a "shielding gas," can be used to confine the flow of the reactant stream and to prevent reactive gas and **product particles** from striking the chamber walls and sensitive parts of the chamber such as optical components."

Thus, the flow is surrounded by an inert gas to reduce undesired coating of chamber components. This teaches toward collection of particles without "sacrificing quality of the particles" since coating the particles on a substrate can **destroy the quality** of the particles as particles since they are converted to a coating.

Thus, the quote cited by the Board for motivation actually teaches away since the coating process can destroy the qualities of the particles as nanoparticles. The only way that this provides any actual motivation is through hindsight.

Next, our discussion turns to Akedo as a whole. Referring to column 2, lines 41-55, Akedo states:

In order to achieve the object, this invention provides a method of forming a film of ultrafine particles comprising the steps of spraying ultrafine particles onto a substrate to form a film of depositing ultrafine particles and, at least before the particles collide with the substrate, irradiating the ultrafine particles and substrate with an ionic, atomic or molecular beam or low-temperature plasma or other high-speed, high-energy beam of high energy atoms or molecules, ..."

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So the Akedo patent teaches that the particles should be bombarded. But the Bi patent teaches that the particles should be shielded with an inert gas. The shielding gas around the Bi flow will deflect the beams of the Akedo apparatus for activating the particles. The teachings in Akedo point away from the combination due to the complexities asserted to manipulate the particles to prepare them for coating formation. While the law requires consideration of the reference as a whole, one must ignore the details of the Akedo patent for the combination to make any sense. By ignoring the cited references as a whole, the Board and Examiner committed clear errors of law.

#### Error of Law - Hindsight Reasoning

Highlights of the law relating to hindsight reasoning are summarized above. We expand on the above discussion and summarize the issues in the context of the nature of the present claimed subject matter. Appellants maintain strenuously that the only way that a conclusion of obvious can be reached in the present situation is based on hindsight reasoning or an unreasonable claim construction.

We note above that Appellants' claims cannot be reasonably interpreted to read on the sequential use of the Bi apparatus to produce and collect particles that are then placed into the Akedo apparatus. Thus, the Patent Office's assertions must be based on directly connecting a laser pyrolysis apparatus as described in Bi to direct particles into the Akeda apparatus. However, these are both extremely complex apparatuses, which is clear from reviewing the references as a whole.

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." MPEP 2143.01 III., citing *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). The Patent Office has consistently used the fact of Appellants' invention as the motivation for the combination. Appellants conceived

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the invention and showed that it works. Then, working backwards, the Patent Office can make the prior art support the rejection. But it is simply **not the law** that the fact a combination can be made supports an obviousness rejection.

Why must the Patent Office analysis involve hindsight based on Appellants' specification? The Bi patent does not point in any way to the desirability of the combination. Some recitation of the usefulness of the apparatus to collect powders just does not point toward performing coatings within a continuous flow as claimed. Also, nothing in the Akedo patent points in any way toward Appellants' claimed invention. In fact, one must ignore layers of complexity in the Akedo patent to make the combination seem plausible at all. But ignoring these layers of complexity in Akedo is directly contrary to the requirement to consider references as a whole.

Due to the lack of suggestion in the references and their significant complexity, the only way that these references can be asserted to lead to Appellants' claimed invention is through hindsight based on Applicants' own disclosure. The Board's footnote 3 strongly evidences the Board's hindsight thinking. The fact that the inventors explain their invention in the context of their earlier work cannot be used against the inventors to argue that their invention is obvious. Using Appellant's specification against them is completely unreasonable and the epitome of hindsight analysis based on Applicants' own specification against them. The present invention is a dramatic advance of the field of high quality coatings formed at high rate.

#### Summary for Groups 1, 4 and 5

Above, Appellants have noted a very clear error of law with respect to the claim construction evidently being adopted by the Board. In addition, Appellants have noted a clear error of law with respect to referencing Appellants' specification as support for the rejection and the clear hindsight involved. Furthermore, Appellants have noted clear errors of law and fact with respect to the Board's neglect of considering to the cited references as a whole. Also, Appellants pointed out

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clear errors of law with respect to the hindsight reasoning underlying the Board's entire analysis. Based on these clear errors of law and errors of fact, the PTO has failed to meet their burden of establishing *prima facie* obvious of the claims of Groups 1, 4 and 5.

Group 2 Claims-Errors of Fact and Law

With all due respect, the Board seems to think that it is obvious to put a rectangular peg into a round hole. With all due respect, the Board seems insistent on using the wrong legal standards for evaluating obviousness and the Board has asserted facts without any support. These errors of law and fact are described explicitly in the following.

With respect to errors of fact, the Board has indicated that appellants' argument that "an elongated reactant stream naturally turns into an elongated product stream" "lacks merit because appealed claim 22 does not limit the shape of the 'product stream' in the coating step." (Board decision at page 13.) With all due respect, this is taught by Bi. Referring to Figs. 2, 3 and 5 of Bi, the product streams marked "NANO PARTICLES OUT" all show an elongated product stream. According to the Examiner's and the Board's theory, this very extended rectangular shaped flow somehow plugs into the Akedo apparatus. In the Board's view, they have essentially eliminated this feature by saying that Bi teaches an elongated reactant flow, but then they completely ignore that Bi also teaches an elongated product flow. One MUST view the references as a whole. The Board's analysis is based on a clear error of fact. To the extent that the Board is interpreting the "product flow" resulting from the reaction differently from "the product flow" that forms the coating, such an interpretation is unreasonable and contrary to the explicit claim language. The antecedent reference of the product flow in the coating steps refers back to a product flow formed by the reaction in the first step.

The Board states on page 12 of the decision that the "examiner is relying on the collective teachings of the references to arrive at a conclusion of obviousness." Thus, this is the board's

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justification for combining the elongated reactant flow in Bi with the cylindrically symmetric coating process of Akedo. However, the law places limits on combinations.

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." MPEP 2143.01 III., citing *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). However, here the combination cannot be combined. Bi teaches this very elongated flow of both reactants and products. It is critical that the elongated flow also relate to products since this gives the high production rates touted in Bi. But the Board asserts without any support that this highly elongated flow somehow becomes this narrow cylindrically symmetric flow taught in Akedo. When viewing the references as a whole, this assertion does not follow from the teachings in the references. Applicants' specification teaches a completely different solution to the issue. Thus, the combined teachings of the references do not render the claims of Group 2 *prima facie* obvious.

B. Rejection Over Lehman, Akedo, Bi, Rao and Kambe

Groups 1 and 5 Claims

Groups 1 and 5 claims have already been argued in detail above as not being *prima facie* obvious over Akedo, Bi and Rao. Kambe has been cited for its teaching of a silicon precursor. While Kambe is combinable for this purpose with Bi. Neither Bi nor Kambe are combinable in the context of Appellants' invention with Akedo or Rao. As noted by the Board, Kambe is cumulative with Bi for the broader issues of claim 18. Lehman is cited for particular materials and is not particularly relevant to the broad issues surrounding group 1 claims. Thus, Kambe and Lehman do not make up for the deficiencies of Akedo, Bi and Rao with respect to claim 18. Appellants maintain that claims 30 and 43 are not *prima facie* obvious over the combined teachings of Lehman, Akedo, Bi, Rao and Kambe for the reason stated above with respect to

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Akedo, Bi and Rao above with respect to group 1 claims for the reasons discussed in detail above.

#### Group 2 Claims

Claims of this group have been fully argued above with respect to Akedo, Bi and Rao. Lehman and Kambe do not add further to this issue with respect to the broad concepts of the claims of group 2. Specifically, with respect to the broader concepts, Kambe is cumulative with Bi, and the teachings of Lehman are not relevant. Appellants maintain that the claims of Group 2 are clearly not *prima facie* obvious over the combined teachings of Lehman, Akedo, Bi, Rao and Kambe for all of the reasons discussed in detail above.

#### C. Rejection Over Akedo, Kambe and Rao

The Board maintained this rejection for the reasons equivalent to the reasons under rejection A over the Akedo, Bi and Rao patents. See Board decision page 20. By a similar note, Appellants' arguments above with respect to the errors of law and fact relating to the rejection of claims over Akedo, Bi and Rao apply with equal force here. For the reasons described in detail above with respect to the rejections over Akedo, Bi and Rao, Appellants maintain that claims 18-26, 28, 29, 33-41, 43-52 and 56-61 are clearly not *prima facie* obvious over the combined teachings of Akedo, Kambe and Rao.

#### D. Rejection Over Lehman, Akedo, Kambe and Rao

The Board noted that this rejection is cumulative with the rejection under rejection B. Appellants agree and refer above to the discussion under section B. In summary, claim 30 is clearly not *prima facie* obvious over the combined teachings of Lehman, Akedo, Kambe and Rao.

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## E. Rejection Over Tran, Lehman, Akedo, Bi, Rao and Kambe

Group 4- Claims

The Board noted that the Examiner cited Tran "to establish that it was known to produce optical components using photolithography." Decision at page 21. All seem in agreement that Tran does not add relevant teaching to the coating methodology. Thus, the patentability of claims 31 and 32 is based on the patentability of claim 18 over Lehman, Akedo, Bi, Rao and Kambe. Appellants' arguments on this point are presented in detail above with respect to clear errors of law and fact in the Board's decision. Appellants maintain that claim 18 is clearly not *prima facie* unpatentable over the combined teachings of Lehman, Bi, Rao and Kambe, and thus claims 31 and 32 are not *prima facie* obvious over the combined teachings of Tran, Lehman, Akedo, Bi, Rao and Kambe.

## F. Rejection Over Tran, Lehman, Akedo, Kambe and Rao

Appellants agree with the Board position that this is identical with Rejection E except that for the substitution of Kambe for the equivalent reference Bi. For all of the reasons discussed above, claims 31 and 32 are not *prima facie* obvious over the cumulative teachings of Tran, Lehman, Akedo, Kambe and Rao for the same reasons that the claims are not *prima facie* obvious over Tran, Lehman, Akedo, Bi and Rao.

## G. Rejection Over Borner, Bi and Rao

Group 1 Claims 18-21, 23, 25, 28 and 29Error of Law - Claim Construction

The start of a patentability analysis necessarily begins with claim construction. See for example the discussion of a Graham analysis in MPEP 2141. With all due respect, the Board did



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not make it clear how they are constructing Appellants' claims. The legal standards for interpreting claims are discussed in detail above.

The second step of Appellants' claim 18 indicates that "the product flow" from the reaction of the first method step be directed to a substrate for coating. A flow by definition is in continuous motion. See the dictionary definition above. While the flow of product particles can be redirected while maintaining the flow, the flow cannot be stopped, such as by collecting the product particles. As such, a person of ordinary skill in the art would not interpret claim 18 to encompass collecting product particles prior to forming the coating. Such an interpretation involves a clearly and completely unreasonable claim construction since it is directly contrary to the claim language.

The Board states on page 24 of the Decision that "As we discussed previously, Bi provides the requisite motivation, suggestion, or teaching to produce nanoparticles, which would be inclusive of synthetic mica nanoparticles, using laser pyrolysis." While not 100% clear, this seems to suggest that the Board is implying using the apparatus of Bi to produce and collect nanoparticles for use in the Börner apparatus. Then, on page 25, the Board states a "person having ordinary skill in the art would have known that some production process would have to be practiced to make particles used in the coating process [of Börner]." Further down on the page, the Board states that "one of ordinary skill in the art would have avoided any problems by following the teachings of Bi. One of ordinary skill in the art would have understood that the particles may be used as Börner's starting material."

With all due respect, the Board has eliminated the step of "directing the flow of the product stream to a substrate" from the construction of Appellants' claim. The substrate is what is coated. The claim indicates unequivocally that the "product stream" is what is formed in the reactive flow. The Board's elimination of this step in their analysis is clearly unreasonable and an extremely clear error of law. The claimed process is all done in situ with a continuous flow.

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A person of ordinary skill in the art would definitely not be interpreting Appellant's claim 18 in the way interpreted by the Board. Such an interpretation necessarily requires rewriting the second step to remove the antecedent reference relating to the product flow. Alternatively, the Board's interpretation requires ignoring the dictionary definition of flow as being continuous. But a person of ordinary skill in the art would definitely interpret flow according to the dictionary definition. A jar of powder with the product particles produced by the reaction is not a flow. If the powders are formed into a new flow, it is not "the flow." This error is specially clear since the Board's interpretation is completely contrary to all of the teaching of Appellants' specification and figures. The Board's claim interpretation is very, very clear **error of law**.

Since the Board's decision is based on a clearly unreasonable claim interpretation, the rejection under G is a clear, unambiguous, irrefutable and reversible error of law. Appellants maintain that the claims of group 1, 4 and 5 are not *prima facie* obvious over the combined teachings of Börner, Bi and Rao.

Appellants could continue with arguments regarding the deficiencies of the references based on a proper claim construction. However, the Board's decision did not refute the arguments in Appellants' Brief and Reply Brief. Thus, Appellants' arguments based on a proper claim construction are incorporated herein by reference from Appellants' Brief and Reply Brief.

#### Group 2 Claims - Errors of Law and Fact

The Board's analysis here is again based on a clearly erroneous claim construction. The connection between the Board's unreasonable claim construction and the associated very clear error of law is discussed in detail above. Here, the Board is again disconnecting the relationship between the reactant flow and the resulting product flow. The Board's clearly unreasonable claim construction leads to the conclusion that the Board's decision is based on a clear, unambiguous, irrefutable and reversible error of law.

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Appellants incorporate by reference their arguments from their Brief and Reply Brief with respect to the deficiencies of Börner, Bi and Rao with respect to the claims of group 2. Appellants maintain that the Board has fallen far short of establishing *prima facie* obviousness of the claims of group 2 based on the combined teachings of Börner, Bi and Rao.

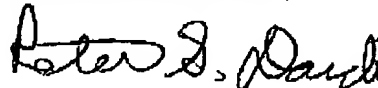
H. Rejection Over Börner, Akedo, Bi and Rao

This rejection involves claims of groups 1, 2, 5 and 6. The claims of group 5 are now being considered with the claims of group 1. The Board did not separately argue the different claim groups. The Board summarily affirmed the rejection based on the arguments made in rejection A. Applicants have noted the deficiencies of the Board's arguments above. For the reasons presented above, The Board's decision is based on very clear errors of law and errors of fact. Applicants maintain that claims 42-54 are very clearly not *prima facie* obvious over the combined teachings of Börner, Akedo, Bi and Rao.

REQUEST FOR RELIEF

Applicants have noted clear legal errors and clear factual errors on the part of the Board in reaching their decision. Appellants respectfully request the reversal of the rejection of claims 18-26, 28-54, 56, 57 and 59-61 and allowance of these claims.

Respectfully submitted,



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